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Stated Meeting, April 2.

Present, twenty-three members.

Judge HOPKINSON, Vice-President, in the Chair.

Letters were read—

From M. Guizot, dated Paris, Dec. 14, 1840; from Mr. John L. Stephens, dated New York, March 13, 1841; and from M. Pierre de Angelis, dated Buenos Ayres, Jan. 8, 1841, acknowledging the honour done them by their election as members of the Society:—

From the Secretary of the Geological Society of London, dated Jan. 7, 1841; from the Secretary of the Royal Asiatic Society, dated Jan. 2, 1841; from the Secretary of the Royal Geographical Society of London, dated Nov. 21, 1840; and from the Secretary of the Royal College of Surgeons, in London, dated Feb. 5, 1841, severally acknowledging the receipt of donations from this Society.

The following donations were received:—

FOR THE LIBRARY.

Astronomical Observations made at the Royal Observatory, Edinburgh, for the Year 1837. By Thomas Henderson, F.R.S., &c. Edinb. 1840. 4to.—*From the Royal Society of London.*

Annuaire Magnétique et Météorologique du Corps des Ingénieurs des Mines de Russie, &c. &c. Année, 1838. St. Petersburg, 1840. 4to.—*From the Imperial Academy of St. Petersburg.*

Journal of the Asiatic Society of Bengal. N. S. No. 18. 1840. 8vo.—*From the Society.*

Proceedings of the Royal Astronomical Society. Vol. V. Nos. 10 and 11. Dec. 1840, Jan. 1841. 8vo.—*From the Society.*

Journal of the Franklin Institute. Third Series. Vol. I. No. 3. March, 1841. 8vo.—*From the Institute.*

The American Quarterly Register, conducted by B. B. Edwards and W. Cogswell. Vol. XIII. No. 3. Feb. 1841. 8vo.—*From the Editors.*

Twenty-third Annual Report of the Controllers of the Public Schools

- of the City and County of Philadelphia. 1841. 8vo.—*From Mr. G. M. Wharton.*
- The American Medical Library and Intelligencer. By Robley Dunglison, M.D., &c. &c. Vol. IV. Nos. 21 & 22, Feb., 1841. 8vo.—*From the Editor.*
- A Discourse on the Character, Properties, and Importance to Man, of the Natural Family of Plants, called Gramineæ or True Grasses. By Wm. Darlington, M.D. West Chester, 1841. 8vo.—*From the Author.*
- Minutes of the General Assembly of the Presbyterian Church in the United States of America. For 1836, 1837, 1838, 1840. Philadelphia. 8vo.—*From Mr. Kane.*
- A Dictionary, Hindoostanee and English. By Capt. Joseph Taylor, revised by W. Hunter, M.D. Calcutta, 1808. 2 Vols. 4to.—*From Mr. G. Henshaw Belcher.*
- Coleccion de Obras y Documentos relativos a la Historia Antigua y Moderna de las Provincias del Rio de la Plata. Par Pedro de Angelis. Tomo Sexto. Buenos Aires, 1837. Fol.—*From the Author.*
- The New Testament, with References to Parallel Passages, &c. &c. New York, 1832.—*From Mr. Vaughan.*

FOR THE CABINET.

A large Specimen of the Red Pipe Stone, from the country of the Sioux Indians.—*From Mr. J. N. Nicollet.*

Dr. Patterson read a paper, entitled "On the Expansion of the Function $x + h$, by Pike Powers, of the University of Virginia;" which was referred to a Committee.

Mr. Walker read a paper, entitled "Astronomical Observations made at Hudson Observatory, lat. $41^{\circ} 14' 40''$ N., and long. $5^{\circ} 25' 45''$ W., by Elias Loomis, Prof. Math. and Nat. Phil. in Western Reserve College;" which was referred to a Committee.

Dr. Patterson described the arrangement of a Thermometer, which he had caused to be attached to a steam boiler at the United States' Mint, for the purpose of indicating the pressure of the steam by reference to the temperature of the water.

The bulb of the thermometer was immersed in a bath of mercury, contained in a bent iron tube passing through the head of the boiler

below the water line; the stem of the thermometer being curved at its lower extremity to correspond with the tube. The scale was graduated as an indicator of pressure in accordance with the results of the experiments made by the Franklin Institute of Pennsylvania. A comparison of its indications with those of a very well made and carefully graduated safety valve, attached to the same boiler, had proved entirely satisfactory.

Dr. John Locke, of Cincinnati, a member of the National Institution, visiting the Society, was invited to make a communication explanatory of the "Safety Guard" of Mr. Cadwalader Evans, of Pittsburg, of which he presented a working model to the notice of the Society.

After some observations on the causes of accidents to high pressure boilers with flues, most of which were referred either to over pressure of saturated steam, or to over heating the flues when the water is low; and a brief historical sketch of the introduction of fusible alloys in aid of the safety valves and gauge cocks; Dr. Locke called the attention of the Society to the model of Mr. Evans's invention.

In this, the fusible alloy is placed in the bottom of an iron tube, which is inserted into the boiler and attached to it steam-tight by a flange at the top, or outer extremity, while the end containing the fusible metal is placed in contact with the upper part of the flue, so as to receive the greatest heat of the part first exposed by low water. A key, like the key of a common lock, pivoted in the alloy, continues fixed while the alloy remains solid, but is free to turn as soon as it fuses. The stem of the key, passing through a collar, terminates on the outside in a cylindrical head or pulley. To this a chain is fixed, which, after being wound round the cylindrical head, passes over a simple pulley at the end of the lever of the safety valve, and there suspends the weight.

While the alloy remains solid, the action of this weight is the same as if it were attached to the lever itself, as in the common arrangement of the safety valve. When the temperature of the "guard" reaches the point for which the alloy was composed; in consequence either of the excessive temperature of the steam that surrounds it, or of the water sinking below the top of the flue on which it rests; the alloy melts: the weight acting on the chain turns the loosened key, the chain is unwound, and the weight, descending upon a platform placed to receive it, relieves the safety valve of its load.

The "safety guard" has the recommendation of great simplicity,

and of placing it out of the power of the engineer to transcend the assigned limit of pressure on the boiler. When it goes into action, it stops the engine for the time, but permits the motion to be renewed as soon as the cause of danger is removed either by the escape of steam or the cooling of the flue. The alloy having again become solid, the chain is passed round the cylinder anew, and the engine proceeds as before.

Dr. Locke illustrated these remarks by successful experiments with the working model. He added, that the apparatus, with different modifications which he described, has been applied to more than twenty boats on the Ohio and Mississippi rivers, during a length of time sufficient to test its practical usefulness, and that it is rapidly gaining popularity with the proprietors of steam-boats, and with the public.

Professor Bache, at the instance of Dr. Locke, gave a brief history of the different applications of fusible metal to steam-boilers.

He stated that the experiments of the Franklin Institute had proved the necessity of preventing the steam from pressing directly on the fusible metal, in consequence of the liability of the metal to separate into portions of different fusibility when submitted to such pressure. He mentioned that Mr. Evans had adopted the same mode of applying fusible metal as the Committee of the Institute, and at about the same time. Professor Bache then described the less perfect apparatus first devised by Mr. Evans, and alluded to one of his own which he had himself published subsequently. He referred to the peculiarities of the arrangement exhibited by Dr. Locke, and expressed his satisfaction at the prospect of the safety guard being introduced into general use, under the auspices of a practical mechanic like Mr. Evans.

Mr. Walker mentioned some strictures which he had received from a correspondent, upon a paper, by Miss Morris "On the Hessian Fly," now in the press of the Society, and of which an abstract was published in its Proceedings for December last.

Dr. Coates argued, that the history of the larva of the Hessian Fly could by no means be considered settled; and that the subject was properly open for present and future examination.

This he endeavoured to support by pointing out inconsistencies in the descriptions of the best writers; remarking, that Mr. James Worth,

and Baron Von Menninger had seen larvæ similar to that described by Miss Morris; the latter of which were thought by Curator Köllar to produce the *Cecidomyia Destructor* of Say, although in Germany, in which that species was not hitherto known to exist; and some of the former of which were found by Mr. Worth, to produce pupæ under the sheath of the leaf, as the *Cecidomyia* does. Other illustrations were drawn by Dr. Coates, from nearly related species; and it was urged that the law by which insects possess a power of accommodation to circumstances, in depositing their eggs in unusual and diversified places, to the great modification of the larva, had never been shown to be inapplicable to this case.

Part of the objections of Mr. Walker's correspondent, were referred by Dr. Coates to an error in the minutes, and which had been transferred to the published Proceedings of the Society; by which Miss Morris was incorrectly represented as mentioning in her paper the parasitic insect which stings the Hessian Fly. In the opinion of Mr. Westwood, as stated by Dr. C., this parasite, generally known as a *Ceraphron*, should be referred to the genus *Pteromalas*.

Mr. Lea, on behalf of the Committee of Publication, laid upon the table Part 3, Vol. VII. of the Transactions of the Society, which completes the volume.

In accordance with a recommendation contained in a Report from the Secretaries, they were discharged from the further consideration of the subject referred to them by the Society's resolution of 15th January last.

Stated Meeting, April 16.

Present, forty-seven members.

MR. DU PONCEAU, President, in the Chair.

Major Graham, of the United States' Army, and Professor Alexander, of Princeton, N. J., members elect, were introduced, signed the Laws, and took their seats.

Letters were read—

From Mr. Francisco Martinez de la Rosa, dated Paris, 15th Feb. 1841, making acknowledgments for the honour of his election to membership:—